Remarks

Claims 1-33 are rejected under 33U.S.C. 112, first paragraph, as failing to comply with the description requirement. Claims 1, 31 and 33 are amended herewith to include language in [0021] and [0026] of the corresponding patent publication. The range of 0.01 to 10 in claim 1 is not recited in the application as filed but nevertheless meets the description requirement because of In re Wertheim, 191 U.S.P.Q 90 (CCPA 1976) and McLaughlin v. Roberts, 197 U.S.P.Q 831 (Pat. Off. Bd. of Pat. Int. 1978). Reconsideration is requested.

Claim 17 is rejected under 35 U.S.C 112, second paragraph, as being indefinite for not including "consisting" after "group". Claim 17 is amended to correct this. Reconsideration is requested.

We turn now to the prior art rejections.

Before discussing the rejections, the following more general discussion is presented.

As indicated in amended claims 1, 31 and 33 the heart of the invention is to control the grain size of the deposit by parameters of specified agitation rates normalized for electrode areas and deposition rate of at least 0.05 mm/hr. Note that these are indicated and listed as operating parameters for nanocrystalline coatings in [0021] taken with [0016] and that [0025] ties deposition rate to nanocrystallinity (where the paragraphs listed are these of the corresponding printed publication). Note that the current density, duty cycle and frequency listed in [0017], [0018], [0019] as operating parameters correlate with deposition rate.

The only applied reference relevant to controlling grain size is Erb et al. U.S. Patent No. 5,433,797 which discloses as controlling grain size of deposit, electrical pulse parameter, and doesn't even mention agitation rates normalized for electrode areas or normalized for applied Ampere average current and deposit rates as claimed.

We turn now to the electrolyte mixing. It is well known to utilize this to maintain a uniform electrolyte concentration and uniform temperature in the electrolyte to avoid formation of concentration and temperature gradients in the electrolyte. This is different from the agitation rate claimed which is expressed and defined in the term of liter per min per cm^2 anode or cathode area (agitation rate normalized for electrode areas) whereas electrolyte mixing is expressed in volume per time unit (e.g. l/min.) or rpm and cannot control grain size.

We turn now to the prior art rejections.

Claim 1-12, 15, 17, 27-31 and 33 are rejected under 35U.S.C. 103(a) as being unpatentable over Erb et al. (U.S. 5,433,797) in view of Lowerheim text "Electroplating" additionally in view of Biberbach et al. (U.S 3,929,593) and Gonzalez et al. (U.S. 6,743,346). Reconsideration is requested.

The rejection is defective because the only one of the applied references directed to preparation of nanocrystalline material is Erb which controls grain size only by pulse electrodeposition and not by agitation rate normalized for electrode area or applied Ampere average current or deposition rate and doesn't even mention agitation rate normalized to electrode area or applied Ampere average current or deposition rate. Please note paragraph (9) of the office action which acknowledges that Erb does not disclose deposition rate or agitation rate normalized to electrode areas. The action refers to Erb reciting in Example 7 stirring electrolytes at 0-500 rpm. This clearly is the electrolyte mixing referred to above and not agitation rate as claimed in claims 1, 31 and 33.

We turn now to the Lowenheim text. Lowenheim is suggesting depleted ions must be replenished for plating to continue indicating in the case of insufficient mass transfer no plating takes place. This is irrelevant to modification of Erb to provide agitation rate normalized to electrode areas and deposition rate to control grain refinement (result of average grain size of 100nm in a deposit).

rate to controlling grain size so there is no reason to combine these with Erb (In other words the combination does not comply with KSR).

Claims 27, 28, 2, 3, 4, 5, 6, 8, 9, 10, 17, 30, 31 are mentioned in paragraphs 13-28 of the rejection. In reply, it is submitted that these are patentable because claims 1, 31 and 33 have been shown above to be patentable over the applied prior art.

In paragraph 24 of the office action claims 16, 18-25 and 32, are rejected under 35U.S.C. 103 (a) as being unpatentable over Erb plus Lowenheim plus Biberbach plus Gonzalez plus admitted prior art. The admitted prior art discussed at pages 9 and 10 of the office action includes hand manipulated applicator and wick, particulates in the electrolyte, and recognition that MEMS have overall dimentions ranging from 1 to 1000μm. This admitted prior art doesn't overcome the deficiencies in application of the applied references explained above, so claims 16, 18-25 and 32 are patentable.

In paragraph 29 of the office action, claims 13 and 14 are rejected under 35 U.S.C 103(a) as unpatentable over Erb plus Lowenheim plus Biberbach plus Gonzalez further in view of Uzoh et al. U.S. 7,378,004 which teaches rotation of substrate holder. Uzoh doesn't cure the basic deficiency in the applied references not teaching agitation rates normalized to electrode areas and deposition rates to control grain size so claims 13 and 14 are patentable over the applied prior art. Reconsideration is requested.

In paragraph 31 of the office action, claim 26 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Erb plus Lowenheim plus Biberbach plus Gonzalez further in view of Hutkin et al. (U.S 4,088,544). Reconsideration is requested.

Hutkin does not cure the deficiency of the other applied prior art in that it does not teach deposition rate and agitation rate normalized to electrode area as being useful for grain refinement.

Please note that corresponding patent applications were allowed in DE, EP, AU, ZA, MX, HK, SG and CA. The claims allowed in DE and IL are the same as those presented by the preliminary amendment of 2/20/2007 in this case.

Allowance is requested.

It is noted that corresponding applications were filed in nine offices besides the U.S. and a chart showing what was cited where has been provided to the undersigned. Four references of the many on the chart have not been cited in the U.S and are treated in the IDS filed concurrently herewith; these are Icxi U.S. 2,961,395; Hui U.S. 6,200,450; Grandmont et al. U.S. 6,030,851, and WO89/07668. WO89/07668 is in Russian and only the title and abstract are in English (no national phase cases were filed). Please consider the four listed references.

Respectfully submitted,

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Date: November 26, 2008